Classic Philosophies on Blindness and Cross-Modal Transfer, 1688-2003

Simon Hayhoe

ORCiD: 0000-0002-4415-9828

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Abstract

This chapter addresses the question, *Has the methodology of cross-modal transfer effected our theory of cognition and blindness to the detriment of the majority of people with visual impairments?* In order to address this question, philosophical and psychological literature in the date range 1688–2008 is surveyed, and methodologies are analysed using an epistemological model of blindness. It is concluded that methodologies used in the study of cross-modal transfer rarely developed a useful epistemology of blindness, or promoted the social inclusion of people with visual impairments. Instead, studies often conflated moral philosophy, intellect and perception for political and religious motives. Two possible solutions to these problems are suggested: firstly, methodology in the study of philosophy and psychology needs to accommodate a spectrum of variables effecting visual impairment; secondly, philosophers and psychologists need to do more to promote the inclusion and understanding of blindness itself, rather than trying to make broad points about the mind and deficit.

Introduction

This chapter surveys classical philosophies on blindness and cross-modal transfer, and how these philosophies' methods have affected our understanding of visual impairment. The study is designed to help the reader understand why we think sense data from low or no vision can only be enhanced or substituted through touch. The survey's discussion is necessary for those working with people who are visually impaired, to understand the epistemology of learning theory and visual impairment in practice.

This chapter is written with professionals, researchers and students of education and related fields in mind – either those developing informal education in social settings such as museums or workplaces, or formal education through institutions such as schools, colleges, or universities. Although this survey is far from the complete story of understanding cognition and blindness, it is a foundation on which future research on blindness and learning can be designed.

Importantly, in this chapter I develop an argument from a previous study, which examined the philosophical influences on English schools for the blind (Hayhoe, 2015), to ask the question: *Has the methodology of cross-modal transfer effected our theory of cognition and blindness to the detriment of the majority of people with visual impairments?*

In this chapter, I discuss this question in relation to two approximate academic periods of philosophy: the first spanning the century following 1688, the second spanning the half century following 1950. In discussing this question, I argue philosophies on blindness have un-naturally divided people into two artificial categories: the sighted and the sightless. Furthermore, I argue these categories have become connected in ways that are unrelated to eyesight and the social needs of people with visual impairments.

I call this epistemological process of categorisation passive exclusion, and this historical development of philosophies an epistemological model of examining blindness –in

my discussion, I shorten this latter long title to the epistemological model of blindness for brevity. In this chapter, I focus on epistemology as a tool to study knowledge development, with a specific emphasis on its social, historical and cultural influences.

The epistemological model of blindness is largely inspired by two sources of literature. The first source is centred on an understanding that the natural sciences are premised on the existence of evolution in the traditional sense. It also examines the philosophical belief in a pre-determined natural order, in which impairments such as blindness exist. The modern source inspiring this refinement is Nagel's (2012) theory that:

> *the mind-body problem is not just a local problem, having to do with the relation between mind, brain and behaviour in living animal organisms, but that it invades our understanding of the entire cosmos and its history*. (Nagel, 2012:P.3)

Consequently, I argue we have tried too hard to classify blindness through a reductionist, unified theory of material philosophy. In doing so, we have over-simplified multifaceted impairments and social categories of impairment, and illogically conflated visual and aesthetic beliefs to construct a *visual disability*.

My second source of inspiration in forming this argument is Popper's (1998, 1979, 2010) argument that our understanding of material is not a phenomenon that can be located in the physical world. Instead, this understanding can only be interpreted through our perceptual and cognitive need to simplify and categorise human physiology, belief and behaviour. This need motivates philosophers to develop artificial categories through crude scientific classes and methodologies. As Popper states:

> *It was first in animals and children, but later also in adults, that I observed the immensely powerful need for regularity - the need which makes them seek for*

regularities; which makes them sometimes experience regularities even where there are none. (Popper, 1979:pp.23-24)

I argue these two influences help us understand how cross-modal transfer has been used by theorists to emphasise sightlessness in people with visual impairment. This philosophy has been used to develop a theory of material philosophy, link blindness to physical disability and damage rather than ability and adaptation.

Consequently, philosophies have helped to reduce and classify blindness into an ethic of ability, inability, disability, handicap and impairment according to its most extreme, prototypical features. During the enlightenment, these philosophies were not just attempting to understand how humans consciously process the material world, they were also moral philosophies - these philosophies were trying to understand if morality was developed internally, or communicated as images of the outer world are.

This study starts with a discussion on the nature and importance of cross-modal transfer.

The Study of Cross-Modal Transfer

In the modern era, two theories of multi-sensory learning have had particular significance on the methodology of learning theory and visual impairment: (1) what can be referred to as cross-modal linkage, in which different forms of sensory data – such as vision, sound, and touch - are processed together in the mind to form a single mental “image” (see for example, Driver & Spence, 2004); and (2) cross-modal transfer, in which sensory experiences associated with one sense can be understood through the stimulation of another sense (Gregory, 1974).

Since the late twentieth century, the psychological theory of cross-modal transfer is recognised as having a significant effect on a general theory of human learning. For example, research on child development by Gottfried, Rose & Bridger (1977) discovered babies' earliest experiences of touch and taste effect their later understanding of other forms of perception.

There is also evidence that, despite an early reliance on touch and taste, adult humans' visual data changes other sensory data when immediate sensory attention is needed. Spence (2010) refers to this as cross-modal attention. For instance, studies of the so-called Colavita effect (Colavita, 1974; Spence, 2009), finds that the mind gives priority to visual information over auditory sensory data during events where auditory and visual data conflict – e.g. if a person's mouth appears to visually mouth one word yet the voice says another, the mind will tend to hear the mouthed word.

Similarly, studies of so-called cross-modal plasticity, where vision is removed and the mind has to rely on other sensory data, shows that sensory images can adapt to rely on other sensory data. For example, research with people who have significant visual impairments has shown that the what is called the visual cortex in the brain can be stimulated by touch (Sathian & Stilla, 2010) – this research subsequently questions whether the visual cortex is designed to process vision alone, as was traditionally thought.

So how did this theory of cross-modal transfer come about? Moreover, how has its theory helped us to understand the learning of people with visual impairments?

To answer these questions, it is vital to understand the historical context of this early period of the enlightenment. For instance, writers have observed the contemporary study of blindness and cross-modal transfer often refers to the Protestant English and Irish enlightenment (Gregory, 1974, 1987; Paulson, 1987; Jay, 1994; Hayhoe, 2003, 2015) - although Hayhoe (2015), Paulson (1987) and Jay (1994) also argue that similar political

philosophies existed in the earlier period of French enlightenment, dating back to what is now referred to as the mind-body problem, or Cartesian-duality (Descartes, 1984).

These writers observe that this philosophical revolution of thinking began with a question posed to the English legal and moral philosopher John Locke by the Irish natural philosopher William Molyneux. This question is reproduced below:

> *Pour Les Auteurs de la Biblioteque*
>
> *Monsieur Waesberg*
>
> *March and Librair*
>
> *a*
>
> *Amsterdam*
>
> *Per Lond. 62*
>
> *6th July 88*
>
> *Dublin July 88*
>
> *A problem proposed to the author of the Essai Philosophique Consernant L'Enteneem*
>
> *A man being born blind and having a globe and a cube, nigh of the same bigness, committed into his hand, and being taught or told, which is called the globe and which the cube, so as easily to distinguish them by touch or feeling; then both things taken from him, and laid on a table. Let us suppose his sight restored to him; whether he could, by his sight, and before he touch them, know which is the globe and which the cube? So whether he could not reach them though they were removed 20 or 1000 feet from him?*

If the learned and ingenious author of this fore mentioned treatise think this problem worth his consideration and answer, he may at any time direct it to one, that much esteem him, and is, his humble servant,

Will: Molyneux

High Ormond's Gate in Dublin, Ireland

Letter from William Molyneux to John Locke, 7th July 1688. From the correspondence of John Locke, The John Locke Collection, Bodlean Library, Oxford University.

Molyneux's question was later reproduced in edited form under the heading On Perception, in the second edition of Locke's (2001) Essay Concerning Human Understanding. This second edition of the essay was published on Locke's return to England after a period of political exile in France – the first edition was published in French in 1688, and the reference to the essay at the start of Molyneux's letter refers to this original essay.

At the time, this form of studying human perception remained untested by natural philosophers. In its range, however, this question did not simply address the narrow study of a relationship between touch and sight. This question was fundamental to understanding the perception and comprehension of a material consciousness separate to the external physical and moral world.

However, the focus of this study was also not simply inspired by a material and cognitive understanding of perception, as Gregory (1974) later argued. Its origin was part of a more complex philosophy of mind, morality and metaphysics that questioned what was known in the human mind (Hayhoe, 2015). This philosophy was designed to challenge the conservative elements of the Anglican Church in England, and to undermine the theological dogmatism of the Roman Catholic Church.

To understand the motivation for this challenge, it's important to recognize the hypothetical discussion of blindness as philosophy of mind on sightlessness. In addition, it's essential to understand the illustration of blindness in Molyneux's original letter to Locke was only part of a discussion on the experience of blindness in Locke's essay.

Consequently, to fully understand the development of cross-modal transfer, I have divided the evolution of this theory into two classical periods of study in the field of cognition and blindness: the first period begins with John Locke's first essay in 1688; the second begins with a renaissance of this philosophy by Richard Gregory in the 1950s. Both periods are essential for teaching us how the epistemology of cross-modal transfer and learning has philosophically evolved, and the mistakes that were made in our assumptions about blindness and learning. I argue that only through critically analysing the epistemology of these studies, can we begin to understand the true learning potential of people with visual impairments.

Lockean Blindness in the Study of Philosophy

John Locke courted political and religious controversy in the early 1680s, and began to encourage debate amongst more radical philosophies of this era. Although staying loyal to the broader cause of the Anglican Church, he formed a circle of philosophers with a similar aim, and philosophers who had influence on the drafting of his essay (Hayhoe, 2015).

As Locke associated with politically dangerous political philosophies – religion and politics were entwined in this era - an order was made for his arrest and he was forced to leave England for Holland. A year later, Charles II also publicly expelled Locke from Christchurch College, Oxford, where Locke was a fellow. Thus, Locke's philosophy of mind became politicised and his methodology of study became associated with the questioning of theological orthodoxy, power and government.

Rather than dampening his influence, Locke's arrest warrant encouraged his political and academic philosophies, and became a focal point for a political counter culture in England. Importantly, Locke also engaged in a secret theological dialogue with Isaac Newton, who also challenged the truth of vision, and more particularly the place of visions in the Bible (Hayhoe, 2015).

In his essay, Locke used examples of non-sighted blindness in a number of passages beyond Molyneux's question. In particular, rather than questioning this notion of blindness as inherent punishment of immorality, Locke argued morality was learnt after birth; i.e. inherited blindness was not a punishment for sin, as many orthodox and dogmatic theologies argued.

For example, under the heading Further Considerations Concerning Innate Principles Both Speculative and Practical, Locke argued that the experience of all sensory modalities was learning. More importantly, in this chapter he identified memory as the foremost mode of understanding, rather than a more inward notion of inherent deliberation released through meditation. This inherent deliberation was previously held to be the key to human understanding. As he stated in his text:

> *[A] blind man I once talked with, who lost his sight by the smallpox when he was a small child [had] no more notion of colours than one born blind. I ask whether anyone can say this man had any ideas of colours in his mind, any more than one born blind? And I think nobody will say that either of them had in his mind any idea of colours at all …*
>
> *[The] truth is, ideas and notions are no more born in us than arts and sciences, though some of them indeed offer themselves to our faculties more readily than others and are therefore more generally received, though that too be according as the organs of*

our bodies and powers of our minds happen to be employed: God having fitted men with faculties and means to discover, receive, and retain truths, accordingly as they are employed. (Locke, 2001:pp.41–42).

Eighteenth century philosophies on blindness and touch

Early in the eighteenth century, the philosopher and Anglican bishop, George Berkley (1899) also offered an answer to Molyneux's question. Like Locke, Berkley concluded that seeing was not an inherent, God-given function, and that what we call sight was learnt rather than inherent. What's more, Berkeley argued that sensory experiences must be discrete, with vision being processed separately from sound and touch, and subsequently certain mental concepts could only be understood by sight. As he wrote on this answer:

[A] man born blind, being made to see, would at first have no idea of distance by sight; the sun and stars, the remotest objects as well as the nearer, would all seem to be in his eye, or rather in his mind. (Berkeley, 1899:p.187)

More importantly, however, in this era a possible empirical test to this solution was offered. Some fifteen years after Berkeley, the philosopher and surgeon William Cheselden (1839) developed a procedure for removing cataracts, allowing him to observe a boy born with no usable sight after surgery. Although prior to surgery the boy would have some understanding of light – he was said to be able to distinguish day from night - his vision was sufficiently impaired that he was unable to see objects through what light perception remained. What's more, as sensory data from light was so abstracted in the boy's mind, it could not provide a visual image, rendering colour patterns from objects vague and flat at best.

Consequently, the boy's relationship with physical objects before surgery was largely through holding and feeling them, and not usefully through understanding their shape

visually. Similarly, the boy's understanding of his environment was also through his non-visual senses, through physically moving through his environment or sensing his reflection of noise. Subsequently, the boy had no understanding of space through sight, as the light in his world was two-dimensional.

After the boy's eyes had sufficiently recovered from surgery, it soon became clear to Cheselden the boy could not understand the concept of distance or objects by sight alone. What's more, when Cheselden showed the boy objects that were out of reach and that he'd previously held before surgery, the boy did not recognise them at first. It was only when the boy re-held the objects that he began to recognise them by what he assumed was by sight.

However, following this early period of confusion Cheselden observed the boy could associate his experiences of handling objects to identifying the objects whilst seeing them alone. After a period of learning by sight what he had held by hand, the boy learnt to recognise many of these objects by sight alone, as if the boy was learning objects for the first time. Subsequently, Cheselden made the following observation:

> *When he first saw, he was so far from making any judgement about distances that he thought all objects whatever touched his eyes (as he expressed it) as what he felt did his skin … He knew not the shape of anything, nor any one thing from another, no matter how different in shape or magnitude: but on being told what things were, whose form he before knew from feeling, he would carefully observe them that he might know them again; but having too many objects to learn at once he forgot many of them*. (Cheselden, 1839:p.11)

Following Berkeley and Cheselden, and using a method of intuitive observation, Denis Diderot's (2001) Letter on the Blind for Those Who Can See promoted the intellectual equality of people with visual impairments. Significantly, Diderot's philosophy was particularly

important for its consequences on the development of schools for the blind later in the century, and the French politicisation of blindness (Paulson, 1987). Through Diderot, material philosophies also began to normalise touch as an ethically, emotionally and intellectually driven sensory modality. Furthermore, defying Roman Catholic orthodoxy, Diderot argued morality was developed internally, and morals were learnt without recourse to specific or finite senses. As Diderot observed on this issue:

> *How different is the morality of the blind man from ours? And how different would that of a deaf man from his? And how to one with an extra sense, how deficient would our morality appear – to say nothing more? Our metaphysics and theirs agree no better*. (Diderot, 2001:p.156).

Like Locke's earlier essay, Diderot's letter also challenged the cultural power of the Roman Catholic church, by arguing visually impaired people become physically attached to the arts through touch and hearing. In making this argument, Diderot looked beyond simple intellectual classifications, and asserted touch was not simply perceptual, but could be a mode of social justice.

However, in arguing for an equality of the senses, Diderot also did not believe the senses were equivalent, or that sensory data had cognitive parallels through other senses. Instead, Diderot believed that senses were naturally created to comprehend discrete forms of packaged sensory data, or the temporal difference between objects and the space that surrounded them.

For example, Diderot argued that touch could be important for understanding a person's very existence, as without tactile contact the world had a different sensory quality. What's more, and unlike sight, without touch the nature of the world is not experienced as a sense of being connected to the earth, but as an abstract notion. Consequently, Diderot felt

touch could be a more honest modality for understanding the true nature of our environment.

> *Nurses help [babies] to acquire the notion of a continuance of absent persons by playing a game which consists in hiding the face, and showing it again. Thus, they learn a hundred times in a quarter of an hour that what ceases to appear does not necessarily cease to exist. From this it follows that we owe the notion of the continuous existence of objects to experience, of their distance to the sense of touch; that it would be surprising should the aid of one of the senses be necessary to another; and that touch, which ascertains the existence of objects exterior to ourselves when present to our eyes, is similarly the sense to which the confirmation not only of these figures, and other details of these objects, but even their presence is reserved.* (Diderot, 2001:p.181)

However, despite promoting social justice for people with visual impairments, Paulson (1987) later argued Diderot seemed to create a new form of romanticised mythology about blindness. Furthermore, Paulson observed that in his letter Diderot went as far as to suggest sightlessness could be advantageous to the human minds understanding of the outer world. This claim later inspired French writers in the nineteenth century to elevate fictitious blind characters to an almost fabled status.

Undeniably, this philosophy was not unique, and similar mythologies existed from antiquity, with a belief in sightless inner-vision in ancient Greece in particular (Barasch, 2001). However, Diderot's material philosophy differed as it further separated the development of consciousness through perception from a belief in the direct interference of God. As a consequence, and as Jay (1994) argued, it is without doubt that Diderot's essay was

epistemologically important, as it became the seedbed for general philosophies of both material and language.

> *Diderot's first argument concerned the value of touch, which he claimed was as potent a source of knowledge as vision. One recent French commentator, Elizabeth de Fontenay, has gone so far as to say that in the Letter 'The great victor in this carnival of the senses established on the ruins of the castle of the eye and consciousness is touch' …*
>
> *For a materialist like Diderot, the dethroning of vision was especially appealing, for although he sarcastically calls idealism 'an extravagant system which should to my thinking have been the offspring of blindness itself,' he recognised the tendential linkage between privileging ideas in the mind and the putative superiority of vision.* (Jay, 1994:p.100-101)

Early philosophies of cross-modal transfer also inspired the first published proposal for the education of people with visual impairment in the style of Diderot's letter. This proposal was published in an open letter in 1774 by Thomas Blacklock, a Presbyterian Minister and philosopher who was later to create Edinburgh's Asylum for the Blind – for the purposes of his letter, Blacklock wrote under the pseudonym Demodocus, a blind bard in Homer's Odyssey, who was deprived of sight by the Muses, the ancient Greek goddesses (Hayhoe, 2015).

Blacklock was born in the rural county of Dumfries & Galloway, and died in Edinburgh in 1791, obtained a doctorate from Marischal College, Aberdeen, and preached in Edinburgh. Blacklock's letter was published in a well-known political journal from the enlightenment, the Edinburgh Magazine and Review (Demodocus, 1774). Blacklock himself was blinded at the

age of six-months from smallpox, and he referred to his blindness at several points in this letter.

In his letter, Demodocus cited the cross-modal use of touch as a substitute for vision, and to promote an academic, musical and vocational education and a liberal pedagogy. As with Diderot, the aim of Demodocus' letter was to develop an ethical treatment of a blind social underclass that was often found begging in the major cities of Europe. Drawing from moral philosophy, Demodocus also saw the cause of the population of people with visual impairments as overtly political, and one which effected religious belief.

> *The data which they explore may be presented in such a manner, as to render discoveries easier; but still let invention be allowed to co-operate. The internal triumph and exultation which the mind feels free from the attainment and conviction of new truths, heightens their charms, impresses them deep on the memory, and gives them an influence in practice, which they could not otherwise have boasted.* (Demodocus, 1774:p.680)

In his letter Demodocus also gave examples of successful people with visual impairments in the aristocracy, commerce, government, and academia. Most notable amongst these examples was Nicholas Sanderson - Sanderson, a protégé of Isaac Newton, was a recent Lucasian professor of mathematics at Cambridge University, and invented a system of mathematical pin-prick language.

However, despite his belief in the academic ability of people with visual impairments, Demodocus still saw total blindness – his own form of blindness - as a form of moral disability. Consequently, and like his colleague Hume (1749), Demodocus stressed the person who lived "in darkness" still felt threatened in daily life, and struggled to overcome a moral dread.

> *Those philosophers who have attempted to break the alliance between darkness and spectres, were certainly inspired by laudable motives. But they must give us leave to assert there is a natural and essential connection between night and oreus. Were we endowed with senses to advertise us of every noxious object before its congruity could render it formidable, our panics would probably be less frequent and sensible than we really feel them. Darkness and silence therefore have something dreadful in them, because they supersede the vigilance of those senses which give us the earliest notices of things.* (Demodocus, 1774:p.679)

Contemporary replications of Cheselden's study

Although empirically moving on from the political and religious enlightenment of the seventeenth and eighteenth centuries, contemporary philosophies of blindness replicated earlier methods and categorisation. The most widely cited of these studies began in the late 1950s, when Richard Gregory and his research assistant Jean Wallace re-problematized Molyneux's question (Gregory, 1974) – although previous studies, such as one by the phenomenologist von Senden, had tested Molyneux's questions, Gregory & Wallace were the first to use a method much like that of Cheselden. As with Cheselden's case study, Gregory & Wallace studied a fifty-two-year-old man, SB, who had recently been successfully treated for congenital cataracts and had no previously usable vision.

Drawing on Cheselden's method, Gregory & Wallace observed SB's experiences in the period immediately after his eyes physically recovered, seeing SB's response to his environment. Furthermore, Gregory & Wallace contrived situations in which SB could be presented with structured, empirical tasks including: visits to museums and city centres to gauge SB's recognition of objects; drawing familiar objects when he had never tried this art

before; and the recognition of objects he'd previously felt when he was visually impaired. Subsequently, Gregory & Wallace were the first to describe the observations that transpired as *cross-modal transfer*.

Gregory & Wallace's observations and tests were recorded qualitatively, with the remainder of their data coming from health and school records provided by SB. For example, in Gregory & Wallace's later publication of the case study, it was said: "[SB] found that when looking down from a high window (about 30-40 feet above the ground) he thought that he could safely lower himself down by his hands." (Gregory, 1974:p.101)

Many of Cheselden's original observations were replicated in SB's case study, with Gregory & Wallace finding that SB could appreciate objects aesthetically by sight – casting doubt on previous phenomenological studies by the likes of Revesz (1950) and von Senden (1932), which favoured Hume's philosophy that sensory information had discrete values (Hayhoe, 2015). Subsequently, in their concluding remarks Gregory & Wallace argued of Berkley's boy and of SB:

> *One may even say that their attempt to see was made long before their eyes were opened to the light, and in this respect they differ not only from most other cases in the literature but also of course from infants.* (Gregory, 1989:p.117)

However, despite SB's ability to become used to his environment through sight, Gregory & Wallace also observed the emotional problems that this transition caused. This difficulty appeared to illustrate not only a psychological difference of cognition, but also a cultural difference between a largely sighted and a largely tactile world that SB never reconciled.

For example, Gregory & Wallace observed SB became depressed because of this transition. Although this depression was at its strongest just after his operation, it lingered far

longer than was healthy – this depression was a new phenomenon, something that had not been reported before SB's surgery. After keeping in touch with him after he left hospital, Gregory & Wallace also found SB tried to recreate a non-visual world in private, often sitting at home in darkened rooms. In the long term, he never seemed comfortable or happy with his new visual world, and died not long after Gregory & Wallace's contact finished. Understandably, Gregory & Wallace found SB's death disturbing, particularly after becoming close to him during their study, and Gregory subsequently recorded the following in his diary:

> On 2 August 1960, S.B. died.
>
> *His story is in some ways tragic. He suffered one of the greatest handicaps (sic.), and yet he lived with energy and enthusiasm. When his handicap was apparently swept away, as by a miracle, he lost his peace and his self-respect.*
>
> *We may feel disappointment at a private dream come true: S.B. found disappointment with what he took to be reality.* (Gregory, 1974:p.114)

Later in the twentieth century, Gregory's observations were replicated by Oliver Sacks (1995) in his study of a middle-aged person recovering from surgery to gain sight for the first time. Sacks began this study after he was approached by the family of a fifty-year-old man, to whom he gave the pseudonym Virgil. Sacks described Virgil as someone:

> *who had been virtually blind since early childhood. He had thick cataracts, and was said also to have retinitis pigmentosa, a hereditary condition that slowly but implacably eats away at the retinas*. (Sacks, 1995:p.63)

In his study, Sacks borrowed from Gregory's methodology, going as far as to consult Gregory about his and Wallace's work with SB. Subsequently, Sacks collected educational and medical records from Virgil, observed Virgil not long after his surgery and conducted tests on his ability to recognise objects by sight. In addition, Sacks had a significant extra advantage,

as he was also given permission to refer to the diaries of Virgil's sister, collected from childhood to the time of the study.

As a physician himself, Sacks observed Virgil's medical records provided little usable or objective results, and so largely these documents remained unused in his analysis. Instead, Sacks found Gregory's methodology of observation and structured tasks more useful, and discussed qualitative data, constructing a narrative case study.

On publishing his results, Sacks found many similarities with Cheselden's and Gregory & Wallace's observations, and cast further doubt on the phenomenological studies criticised by Gregory & Wallace. The most notable similarity with SB was that even after his eyes recovered from surgery, Virgil would still rely on touch to familiarise himself with objects. For example, after their first meeting at the airport, Sacks observed "[Virgil pointed] to all of the cars we passed ... 'Look at that one' he exclaimed once. 'I have to look down!' and bending felt it." (Sacks, 1995:p.66)

Furthermore, Sacks also found Gregory & Wallace's earlier observation that a transition from blindness to sightedness could disrupt Virgil's mental health. For example, Sacks found that during his study Virgil became depressed and would often recreate his earlier blindness at home, switching off lights and sitting in a darkened room. However, in a paradoxical change of fortune, and following further illness, Virgil lost his sight for a second time shortly afterwards, an event which improved his mental health. As Sacks noted in his case study:

> *[Now] a final blindness - a blindness he received as a gift. Now, at last, Virgil is allowed to see, allowed to escape from the glaring and confusing world of sight and space, and to return to his own being, the touch world that has been his home for almost fifty years.* (Sacks, 1995:p.73)

Material philosophies after Gregory & Wallace

In the latter years of the twentieth century, the philosophy of blindness had a renaissance and material philosophers found themselves inspired by the epistemology of enlightenment. Importantly, like Gregory & Wallace, material philosophers in the twentieth and twenty-first centuries also attempted to replicate the methodology and classification of moral philosophies.

For instance, as Rene Descartes (1984) used the analogue of a cat to represent superior vision, Thomas Nagel (1991) used the analogue of a bat to represent experiences of sightlessness. And like Descartes, Nagel's aim in doing so was to show the subjectivity of the experience of sightlessness, arguing it provided a unique experience of objects and the environment.

Drawing on Hume's (1749) theory of the colour red, Nagel's philosophy was in common with Diderot's (2001) belief that the senses were equal but discrete. Consequently, Nagel theorised visual concepts such as colour could only be understood through direct experiences of seeing colour; the only exception being when light and dark shades of the same colour are seen, and the mind can imagine the individual shade in between.

However, and unlike Hume and Diderot, Nagel argued there were two types of understanding: objective and subjective sensory concepts. Subjective understanding, Nagel argued, could only be understood through direct experience, whereas objective understanding could only be communicated through language.

More particularly, Nagel observed that language cannot be used as an analogue for subjective experiences, which cannot be imagined as others see them, finding sensory analogies with synthesisia – where a colour is heard or smelt, rather than seen - were miss-appropriated. What's more, Nagel argued that using language with direct links to a visual

vocabulary – such as describing bread as 'looking warm' or sky that 'looks cold' – with people who are born blind cannot lead to subjective understanding.

For Nagel, if a person never saw they would never be able to understand a sense they had never experienced, even when vision was presented as an analogy. Thus, Nagel argued, blindness is a subjective deficiency in a sighted world, but not an objective one. Therefore, cross-modal thinking can only be based on direct experiences of phenomena, and language or symbolic knowledge merely elucidates objective visual concepts – i.e. experiences render these concepts understandable only by their subjective and direct experience.

> *One might try … to develop concepts that could be used to explain to a person blind from birth what it was like to see. One would reach a blank wall eventually, but it should be possible to devise a method of expressing in objective terms much more than we can at present, and with much greater precision. The loose inter-modal analogies – for example, 'Red is like the sound of a trumpet' – which crop up in discussions of this subject are of little use. That should be clear to anyone who has both heard a trumpet and seen red. But structural features of perception might be more accessible to objective description, even though something would be left out. And concepts alternative to those we learn in the first person may enable us to arrive at a kind of understanding even of our own experience which is denied us by the very ease of our description and lack of distance that subjective concepts afford*." (Nagel, 1991:p.179)

Taking inspiration from the correspondence of philosophers such as Locke and Molyneux, Bryan Magee & Martin Milligan (1998) formed contrasting opinions on cross-modal transfer. Milligan, who was himself visually impaired and campaigned for the rights of visually impaired people, argued his own experiences through touch provided a unique view

on the world. Like Diderot, Milligan felt these experiences, although different, were no less morally or intellectually deficient than those of people with sight.

Conversely, and similar to Nagel and Hume, Magee argued that lacking sight also led to a deficit of subjective experience, of semantics of language and of an understanding of visual imagination. What's more, Magee argued blindness could not allow Milligan to comprehend the experiences of sighted people. Instead, Magee argued Milligan's experience of the world was segmented and uncontinuous, as Milligan could only touch a single object at a time. For instance, Magee observed, Milligan could not conceptualise visual concepts requiring distance beyond his reach.

Although similar to Diderot in agreeing touch was segmented, Milligan felt sight could be dishonest, describing it as a *hungry* sense, which must experience everything all the time. Consequently, Milligan suggested, people with vision needed to see aesthetically and greedily whilst they were awoken, and rarely distinguished between experiences and aesthetics. Contrariwise, touch was selective, and therefore took time to carefully discriminate between different sensory experiences. Touch is subsequently less greedy, and more of a *gourmand* of the aesthetics and the world it encounters. As Milligan argued:

> *By the sighted, seeing is felt as a need. And it is the feeding of this almost ungovernable craving that constitutes the ongoing pleasure of sight. It is as if we were desperately hungry all the time, in such a way that only if we were eating all the time could we be content – so we eat all the time.*
>
> *Because the realization seems to be lacking, your conception of the pleasures of sight appears altogether too aesthetic, as if someone were to suppose that the only pleasures involved in eating and drinking were those of the gourmet. There are, of course, aesthetic visual pleasures, but for most of us these are associated with rare or*

special occasions – looking at a painting or a landscape, seeing a beautiful woman, going to the ballet. Not many of us are lucky to see beautiful objects every day, whereas the normal pleasures of seeing, which is some sort of hungered-for and deeply needed satisfyingness, accompanies us all the time we are awake. (Magee & Milligan, 1998:p.135)

In common with Nagel and Magee, Robert Hopkins (2000, 2003) argued that people who are sighted differ from people who are blind quantitatively, as they had superior sensory experiences. Through a review of studies on the comprehension of tactile pictures by people with visual impairments, Hopkins hypothesised distance and perspective have different qualities to those without sight.

Therefore, people with sight have an advantage when touching objects' features that are associated with vision, such as foreshortening in tactile pictures – the concept of far-away objects feeling smaller than those in the foreground. Their experience of vision, Hopkins argued, allows people without visual impairments to experience touch through their visual experience as well as their tactile sensation.

Consequently, Hopkins argued, sculpture is the only exceptional art form for people who have no sight and no visual experience. Sculpture, he continued, simulated space more completely than a tactile picture could, as it did not involve metaphors or visual symbolism. Sculpture was a unique form of art, which lent itself to further interpretation beyond that of mere sightedness. Where pictures were created primarily for vision, sculpture was a more democratic reproduction of the real world, lending itself to little interpretation.

[Sculpture] is able to straddle the divide between the represented and representing, as painting does not, precisely because it does not incorporate a perspective on what it represents. … [Sculpture's] fundamental source is our awareness of our own

> *possibilities for movement and action. That awareness is not something we derive from any particular sense, so much as something which informs experience in every sense modality. Thus, in offering us the form of engagement [Suzanne] Langer describes, sculpture is neither visual, nor tactile, but a complex mixture of the sensory, as standardly conceived, with our awareness of our own bodies, and their possible interactions with the world.* (Hopkins, 2003:pp.25-26)

Discussion

In the introduction to this chapter, I asked the following question: *Has the methodology of cross-modal transfer effected our theory of cognition and blindness to the detriment of the majority of people with visual impairments?*

I would argue that it has.

The methodologies of early philosophical studies of cross-modal transfer mostly lacked imagination in developing an epistemology of blindness, or in promoting the social inclusion of people with visual impairments. Instead, the categorisation and ontology of cross-modal transfer was conflated with moral philosophy, and used enlightened thinking as a tool to challenge orthodox religion and political power.

Importantly, Molyneux's question was not asked in isolation. Neither was this question the only instance of a consideration of blindness by Locke or his circle of philosophers; nor was it the only use of a methodology that can be referred to as *political blindness* by the philosophers that followed Locke in the eighteenth century. Importantly, the methodological assumption that experiences of blindness were wholly sightless was repeated elsewhere in Locke's essay, and discussed and examined more than other perceptual impairments as an example of ignorance. Consequently, the motivation for a so-called

enlightened study of blindness was in part to show a lack of an inherited visual ability alone as evidence of internal morality.

The biased and ill-conceived methodologies of enlightened philosophies were to have consequences for later material philosophies of blindness. Following the enlightenment, material philosophies repeated the miss-categorisation of people as either sighted or sightless. Subsequently, the use of blindness and touch as a symbol of philosophy and equality also elevated people without sight to case studies of visual impairment, rather than as exceptions to the norm. This use of cross-modal transfer also made the plight of the wholly sightless infamous, and an object of moral fascination, singling such people out as examples of inequality.

Consequently, enlightened philosophies of cross-modal transfer and non-visual perception were not based on the practical logic of supporting or teaching people with visual impairments. What's more, their understanding of non-visual perception was often concentrated on developing a belief that non-visual perception could only partially make up for vision loss – even Diderot and Blacklock believed touch had a different cognitive as well as perceptual quality.

This categorisation of blindness thus brought prejudice as much as it developed useful knowledge. Subsequently, in the twentieth century although through observations Gregory and Sacks empirically illustrated learned perceptions, they also repeated the stereotype of blindness as sightlessness. This belief was yet again repeated by the material philosophies of Nagel, Magee & Milligan, and Hopkins.

Consequently, educators who are influenced by these studies develop their own theories in the belief that touch is a primary mode of learning (Hayhoe, 2015). This largely explains why *institutions for the blind* have focused on handwork, touch, vibration and audible

communication in the past - these were often the only medium of communication, imagination and vocation for over two hundred years. These philosophies of cross-modal transfer also had the inadvertent effect of producing reductionist and biased ideas about blindness in the development of touch languages and technologies.

For instance, the use of such symbols as Braille labelling and literature have come to be seen as inclusion for people who are blind. However, this stereotyping of people who are visually impaired serves them badly, as it is estimated that the majority of people with visual impairments have little need or want for Braille - for instance, in 2012 it was found that the great majority of British people registered blind do not read Braille, and rely on audio books or digital readers either to speak or enlarge text (RNIB, 2012; Creaser & Spacey, 2012).

Subsequently, this sole reliance on Braille in traditional education, buildings and reading materials produced for people with visual impairments has promoted passive exclusion (Hayhoe, 2015, 2016). What's more, this reliance on touch in colleges and the workplace has also restricted life-chances and often led people with visual impairments to believe they are incapable of vocational, intellectual or artistic activities (see for example, Hayhoe, 2008, 2011).

Conclusion

It's undeniable the philosophies discussed in this chapter provided a body of theory on perception that was testable through empiricism, and these philosophies have motivated inclusion in education. Without cross-modal transfer, children with visual impairments would not have received an education, strategies of teaching would not be unconsidered important, and building accessibility and accessible technologies would not have developed. As importantly, these theories also provide us with a discourse for informed debate on inclusion

and disability. Philosophies from the enlightenment in particular have given us our contemporary moral values of social justice and equality, and raised such moral issues in the public consciousness.

However, the original philosophies of the enlightenment were not just trying to raise the status of people with visual impairments they were also trying to create a general moral and political philosophy. Consequently, it suited these philosophers to categorise people with visual impairments as a sightless population rather than a population with restricted sight.

This problem has improved little in the modern era: whereas the understanding of these philosophies evolved significantly, and our understanding of human capacity has improved through a critical evaluation of previous generations of philosophy, methods have evolved little. Subsequently, modern material philosophies – and psychologies – of blindness still focus on blindness as sightlessness, and see the support of people with visual impairment as largely being premised on touch. This has hampered the progress of inclusion and the pedagogical strategies we need to teach people with visual impairments alongside people with full sight.

Consequently, a potential solution to this problem is two-fold. Firstly, philosophy, particularly philosophies that inform cognitive studies of blindness, need an updated methodology. This methodology needs to see the ontology of people with visual impairments as a spectrum of needs based on different forms of perception, as well as different social and broader cultural needs. Secondly, philosophers should only consider creating philosophies of blindness if their aim is to promote the inclusion and understanding of blindness itself, and not make broader points about the mind. It's only when people with visual impairments are not regarded as this separate perceptual species will blindness be seen largely as a human issue rather than a cognitive novelty and deficit.

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